(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 200 503**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **86303159.7**

(22) Date of filing: **25.04.86**

(51) Int. Cl.[4]: **B 65 D 71/00**

(30) Priority: **29.04.85 GB 8510849**

(43) Date of publication of application:
05.11.86 Bulletin 86/45

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI NL SE

(71) Applicant: **UNILEVER PLC**
Unilever House Blackfriars P.O. Box 68
London EC4P 4BQ(GB)

(84) Designated Contracting States:
GB

(71) Applicant: **UNILEVER NV**
Burgemeester s'Jacobplein 1 P.O. Box 760
NL-3000 DK Rotterdam(NL)

(84) Designated Contracting States:
BE CH DE FR IT LI NL SE AT

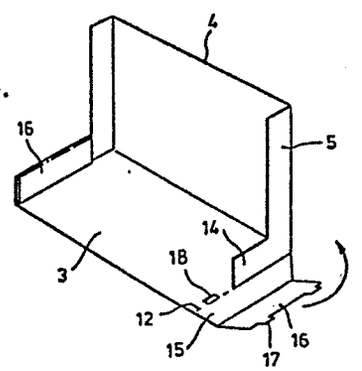
(72) Inventor: **Lawrence, Jack**
21 Russell Square
Longfield, Dartford Kent(GB)

(74) Representative: **Farwell, William Robert et al,**
PHILLIPS & LEIGH 7 Staple Inn Holborn
London WC1V 7QF(GB)

(54) **Packaging.**

(57) Skeleton packs that are designed for compression loading where such packs are themselves to be grouped, as in pallet loads, having a base to receive the primary packages and a rear member to take vertical load.

Fig.4.



EP 0 200 503 A2

PACKAGING

This invention relates to the packaging of a plurality of discrete containers to form unitary packages and to palletising these.

Individual containers of various sizes and made of e.g. cartonboard or plastics materials, so-called primary packs, are commonly grouped together in a fibreboard case, or secondary packing, for distribution purposes. A fibreboard case provides compression strength additional to that of the plurality of individual containers in the case as well as giving added protection by way of puncture resistance. Fibreboard cases are also readily conveyed and handled by mechanical handling equipment and offer the maximum surface area for displaying printed matter. Nevertheless fibreboard cases can represent a significant additional packaging cost over the cost of the individual container cost and many proposals have been made for reducing the area of fibreboard required in a case in order to reduce the total packaging cost. For example, where the individual containers such as cans or bottles have adequate compression strength it can be more economical to provide a multiple package comprising a shallow fibreboard tray enveloped with a plastics film to retain the containers in place. On the other hand, particularly where the individual containers have little or

insufficient compression strength or a shallow tray is otherwise inadequate, various skeletal case designs have been proposed such as in U.S. 3 425 544 and U.S. 2 868 429 having two upstanding walls the full height of the package but these approach a full case again in concept.

Skeleton packs have also been proposed where compression strength is not important, for example in French 79 02523 (publication No. 2 416 625), where packages are held in a two sided pack of a bottom member and rear member by one or more straps formed out of the material of the pack itself. These packs have a sloping top flange on to the rear member shaped to the primary packs, which take the load in any stacking.

We have sought to maximise the material saving in skeleton packs that are designed for compression loading and have seen that where such packs are themselves to be grouped, as in pallet loads, a base to receive the primary packages and a rear member to take vertical load are in essentials all that is needed. If the packs are placed with the front of one adjacent to the back of the next, the rear member in effect acts as part of both packs as far as taking vertical loads goes.

Accordingly the invention provides a pallet load or other assembly of secondary packs each having a base, a back, and folded flanges on opposite upright edges of the back to resist deformation under vertical load, the

packs being filled with primary packages and disposed in the assembly in tiers so that, within the tiers, the back of a given secondary pack is adjacent the front edge of the next said pack whereby the packs in a given tier support those in the next with at most only partial reliance on load bearing by the primary packages.

This allows each pack to save for example 40 or 50 to 70%, more usually 55 to 65% of the area of material of a corresponding standard pack with a compensating increase in weight of the material of for example up to 130% compared with the weight used for standard packs. (Weight is conventionally given as Kg. weight/1000 sq.m. and is a measure of the strength of the material).

Conveniently said packs are so disposed that the lines of contact between adjacent packs within a tier are staggered as between one tier and the next, or a load pad separates tiers, or use is made both of staggering and of a load pad.

The cost savings are of course not generally as great as the savings in area of material because unless a corresponding standard or full pack has been unnecessarily strong, material of greater weight than for a full pack has to be used, but according to the kind of primary packages intended and the strength needed within the load (for example for stacking or non-stacking of pallets, or individual handling or container carriage), cost savings available are up to 50% or even more. Even when cost

savings are lower, for example down to 7% or 8%, they are still very significant on large production runs on the low profit margins common in packaging.

A table of examples of the relation for particular cases and primary packs (back member on long side of base) is:

Case size (mm)	Board area saving	Weight increase required in board	Corresponding cost saving
A. Base 470 x 240 Height 180	61%	Up to 126%	Up to 39%
B. Base 320 x 240 Height 140	65%	Up to 126%	Up to 50%
C. Base 570 x 155 Height 225	56%	Up to 85%	Up to 32%
D. Base 367 x 200 Height 289	63%	Up to 126%	Up to 42%

The above are simply examples of what can be achieved, without restriction of the invention to any particular set of figures. The saving in area of material is as against a standard case, that is to say a case with four sides and with the top and bottom of overlying pairs of centrally meeting flaps provided on the top and bottom of opposing sides. The compensating increase in board weight is in relation to the board weight used in a standard pack for the same primary packs and vertical load, for packs surrounded by others.

While the invention primarily lies in the complete pallet load or the like, it can also be regarded as lying in the packs, whether as such or filled with primary packages.

Thus according to a further aspect of the present invention there is provided a secondary pack for a group of primary packages comprising a base panel and a vertical panel having flanges connected to each of its opposite vertical edges extending along the length thereof which flanges have a width over at least part of their height less than the width of the base panel.

According to a second further aspect of the present invention there is provided such a pack when in use with a group of primary packages, the pack having the base panel co-extensive with the base of the group and the vertical rectangular panel of a height not less than the height of the group; the flanges extending only partly across the respective face of the group; and retaining means retaining the group of primary packs in position on the support member.

The support member can be folded from a flat sheet of material such as corrugated fibreboard and uses a minimum of board area and hence can be provided at minimum cost. Because the flanges extend up the vertical panel they provide the maximum reinforcement to the vertical panel and themselves contribute significantly to the compression strength of the package. As discussed

above, the grade or weight of board necessary to provide the package with the same compression strength as a full case is obviously greater than that of the case but many primary packs are such that they provide a contribution to stacking strength and the necessary increase in board weight and cost per unit area may be as little as 20%. If however the contribution provided by the primary packs is ignored it can readily be found that comparable stacking strengths are achieved between a full case and a support member according to the invention if the weight of board for the support member is 60% greater than that of the case. Since in such an example the board area required may be only about 45% of the area required for a case there is a good saving in cost of the fibreboard. Part of this saving is lost in providing the retaining means but the overall savings afforded by packages according to the invention as compared to a full case are still considerable.

The base panel provides a level underside to the package enabling the package to be conveyed on standard conveying equipment.

Preferably flanges are provided on two opposite edges of the base panel to extend partly across the respective faces of the group, which flanges assist in locating the group on the support member prior to any retaining means being applied and stiffen the base panel.

The flanges on the base panel and vertical panel can be secured together in overlapping relation, e.g. by gluing or stitching to maintain the vertical panel perpendicular to the base panel. Alternatively the flanges on one of the base or vertical panels can be provided with locking flaps adapted to fold over extension flaps on the other of the flanges and be secured to the panel on which they are provided. In yet another variation the flanges on the base and vertical panels can be connected together whilst allowing the support member to be folded flat with the vertical panel overlapping the base panel for transport to the filling point where the package is made.

The size of a package is usually determined by factors such as the number of primary packs normally sold as a unit and the physical size and weight that can be conveniently handled. For a majority of packages for distribution to the retail trade it has been found that the flanges on the vertical panel should be between 20mm and 60mm preferably 40mm. Flanges on the base panel are conveniently likewise dimensioned.

When the package is to be placed, for example, on a supermarket shelf, and depending upon the size, inherent stability and arrangement of the primary packs to form the group, it may be desirable for the flanges to extend across up to about 50% or even 60% of the respective faces of the group to retain the group of primary packs in position when the retaining means is removed. This increases the board area required for the supporting member but the larger flanges can contribute to the compression strength and the cost of the increased board area be at least partly offset by a reduction in grade of board.

The retaining means can comprise a plastics film and the plastics film can be a stretchwrap film or a shrink film which is heated to shrink around the group of primary packs and support member after it has been applied. Alternatively the retaining means can be one or more straps of suitable material.

The packages can be arranged in tiers of lines and rows and the tiers stacked above one another. The packages in each tier can be arranged in the same pattern of lines and rows as the adjacent tier or the packages of one tier can be arranged to overlap the packages of an adjacent tier. A layer pad comprising a flat sheet of board material may be interposed between each tier of packages in a stack.

A stack of packages can be loaded on a fork lift truck pallet and pallets so loaded can be stacked one upon another.

The invention will now be more particularly described with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a perspective view of a first embodiment of a package according to the invention;

Figure 2 is a perspective view of a second embodiment of a package according to the invention;

Figure 3 is a plan view of a blank for the support member of the package of Figure 2;

Figure 4 is a perspective view of a further embodiment of support member;

Figure 5 is a plan view of a blank for another embodiment of support member;

Figure 6 is a perspective view of the support member formed from the blank of Figure 5;

Figure 7 is a plan view of a tier of packages according to the invention; and

Figure 8 is a side elevation of a stack of tiers of packages according to the invention.

Referring to Figure 1 there is shown a package comprising eight primary packs 1 in the form of cartonboard containers. The primary packs are disposed in two tiers on a corrugated fibreboard support member 2 having a base panel 3 and a vertical panel 4 foldably connected thereto, the height of the vertical panel corresponding to the height of the group of primary packs. Flanges 5 foldably connected to opposite vertical edges 6 of the vertical panel extend the height of the vertical panel and partly across the respective faces of the group of primary packs. Two straps 7 retain the support member around the group of primary packs.

In the embodiment shown in Figure 2 the support member comprises a base panel 3, vertical panel 4 and flanges 5 on the vertical panel as in Figure 1 but additional flanges 8 are provided on the opposite edges of the base panel 3 to extend partly across the respective faces of the group of primary packs. The flanges 5 and 8 overlap at 9 adjacent the fold line connecting the base panel and the vertical panel and are secured together by glue. The support member is retained around the primary packs 1 by a shrink film 10.

Figure 3 shows the blank for the support member of Figure 2 having a base panel 3 foldably joined by fold line 11 to vertical panel 4. The side flanges 5 and 8 foldably joined by fold lines 12 to the vertical and base panels respectively are separated by slots 13 to allow the blank to be erected. The blank can be erected and glued

either prior to a group of primary packs being disposed on the support member so formed or the blank can be erected and glued around a group of packs.

It will be appreciated that the blank area for the support member is considerably less than that required for a case which would completely enclose the primary packs. If the area of board for a case is taken as 100 then the board area of the support member is 45. Nevertheless to retain a similar compression strength the grade of board used for the support member must be increased. In a trial two empty cases were stood side by side and found to have a compression strength of 300kg before deformation beyond the recovery point was created. A similar trial was then conducted with two support members of comparable size according to the invention placed side by side with the vertical panels spaced apart by the width of the base panel. Flanges were provided on both the vertical and base panel, those on the vertical panel each having a width corresponding to about 20% of the width of the base panel. It was found that a compression strength of 300kg was achieved if the grade of board used for the support member was 50% increased in weight ie approximately 50% extra in cost per unit area over that used for the case. Thus whereas the cost of a case can be considered as 100 x 100 (area x cost per unit area) ie 10,000 the cost of a support member can be considered as 45 x 160 ie 7,200, that is 72% of the cost of the case for the same compression strength a saving of 28%. Allowing for the cost of the retaining means the total cost of a package according to the invention is about 23% less than that of a case.

The above comparisons ignore any contribution to the compression strength of the primary packs. Where the primary packs can contribute to compression strength it

has been found possible to use somewhat lighter grades of material for the support member and achieve even greater cost savings

Referring now to Figure 4 there is shown an embodiment of support member which is particularly convenient for hand erection. The flanges 5 on the vertical panel 4 are provided with extension flaps 14 and the flanges on the base panel are formed by an outer flange 15 and an inner flange 16. Tongues 17 on the distal edge of the inner flanges 16 engage in slots 18 in the base panel adjacent the fold line 12 to lock the inner flange in position. When locked in position the extension flaps 14 of the flanges 5 are secured between the inner and outer flanges 16, 15 to maintain the support member erected.

A further alternative blank for a supporting member is shown in Figure 5 in which similar parts of the blank are identified as described with reference to Figure 3. In the embodiment of Figure 5 diagonal fold lines 19 delimiting triangular portions 20 are provided in the flanges 8 extending from the intersection of the slots 13 with the fold lines 12 to the edges of the blank. To erect this blank the flanges 5 and 6 are folded through 180° to overlie the respective vertical and base panels and the portions 20 folded back through 180° along the fold lines 19. Glue can then be applied to the exposed surfaces of the portions 20 and the vertical panel 4 and base panel 3 folded together along fold line 11 to bring the flanges 5 into contact with and secured by the glue to the portions 20.

In this flat condition the support member is readily transported to the filling point where the support member can be erected by folding the base and vertical panels

along line 11 through 90° to open the support member. By virtue of the glued connection between the flanges 5 and the triangular portions 20 this will automatically erect the flanges into the desired positions and the flanges 5 snapped into place with their bottom edges engaging the upper surface of the base panel as shown in Figure 6.

The embodiment of Figures 5 and 6 thus provide a support member which is pre-glued and readily erected for use at a filling station.

Figure 7 shows packages according to the invention arranged in one example of many possible manners of arranging a tier of such packages. The particular arrangement of lines and rows adopted would depend upon the dimension of the packages concerned and in the example illustrated it will be understood that in an adjacent tier the packages 21 on the left hand side could be arranged on the right hand side to obtain a more stable stack.

In the stack of packages shown in Figure 8 a layer pad 22, a single flat sheet of fibreboard material, is interposed between each tier of packages. This layer pad can prevent the packages of one tier crushing or otherwise damaging packages in the tier below. The necessity for such layer pads depends upon the weight of the packages and the number of stacks to be placed one upon the other in storage. As shown in Figure 8 the stack of packages can be disposed on a fork lift truck pallet 23 and may be retained thereon by straps or plastics film as is well known in the art.

In one example a package was formed using the support member of Figures 2 and 3 and disposed therein were 24 primary packs each comprising one 1-lb weight of frozen peas tightly enclosed in a plastic bag. The bags

were arranged upright in two rows of 12 packs and the package enclosed in a stretchwrap plastics film. The support member was of corrugated fibreboard having B fluting 112 g/m², the outer liner being 200 g/m² Kraft and the inner liner being of the same weight but of non Kraft or substitute fibreboard material.

The package had a height of 180 mm a length of 470 mm and a width of 240 mm. The vertical flanges had a width of 40 mm, i.e. about 16% of the width of the base panel.

By comparison the groups of primary packs had previously been packed in corrugated fibreboard case of the same fluting and liner materials but the inner and outer liners were both 150 g/m².

Thus the total liner board weight for the support member was 400 g/m² as compared to 300 g/m² ie an increase of 33% (The primary packs contributed to the stacking strength). Thus with a board area some 45% of that of the case the cost saving on the fibreboard content of the package is some 50%.

The packages were arranged in a stack on a pallet, the stack having 5 tiers of packages each of 12 packages. The total weight of the pallet load was therefore 1440-lb. No damage was found to any of the packages after transporting the pallet load by road from the filling point to a distribution location.

CLAIMS

1. A pallet load or other assembly of secondary packs each having a base, a back, and folded flanges on opposite upright edges of the back to resist deformation under vertical load, the packs being filled with primary packages and disposed in the assembly in tiers so that, within the tiers, the back of a given secondary pack is adjacent the front edge of the next said pack whereby the packs in a given tier support those in the next with at most only partial reliance on load bearing by the primary packages.

2. An assembly of secondary packs according to claim 1, wherein each said pack saves 40 to 70% of the area of material of a corresponding standard pack with a compensating increase in strength of the material up to 130%.

3. An assembly of secondary packs according to claim 1 or 2, wherein said packs are so disposed that the lines of contact between adjacent packs within a tier are staggered as between one tier and the next, or a load pad separates tiers, or use is made both of staggering and of a load pad.

4. A secondary pack for a group of primary packages, comprising a base panel and a vertical panel

foldably connected together, the vertical panel having flanges foldably connected one to each of its opposite vertical edges extending along the length thereof which flanges have a width over at least part of their height less than the width of the base panel.

5. The secondary pack of claim 4 in use with a group of primary packages, said secondary pack having the base panel co-extensive with the base of the group and the vertical rectangular panel of a height not less than the height of the group; the flanges extending only partly across the respective face of the group; and retaining means for retaining the group of primary packs in position on the support member.

6. The secondary pack of claim 4 or 5, wherein flanges are provided on two opposite edges of the base panel to extend partly across the respective faces of the group; which flanges assist in locating the group on the support member prior to any retaining means being applied and stiffen the base panel.

7. The secondary pack of claim 6, wherein the flanges on the base panel and vertical panel are secured together in overlapping relation to maintain the vertical panel perpendicular to the base panel.

8. The secondary pack of claim 6, wherein the flanges on one of the base or vertical panels are provided

with locking flaps adapted to fold over extension flaps on the other of the flanges and be secured to the panel on which they are provided.

9. The secondary pack of claim 6, wherein the flanges on the base and vertical panels are connected together whilst allowing the support member to be folded flat with the vertical panel overlapping the base panel for transport to a filling point where the group is assembled.

10. The secondary pack of any of claims 4 to 9, incorporated in an assembly according to any of claims 1 to 3.

0200503

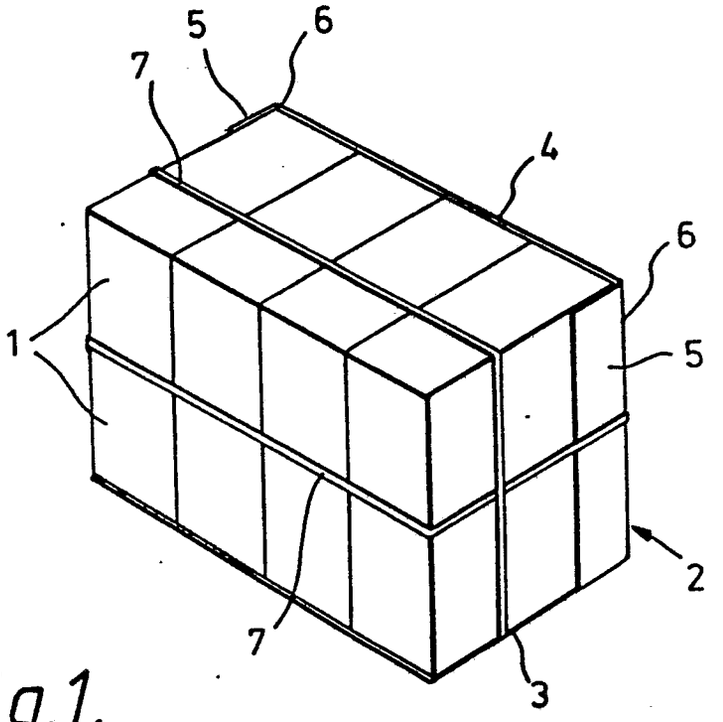


Fig.1.

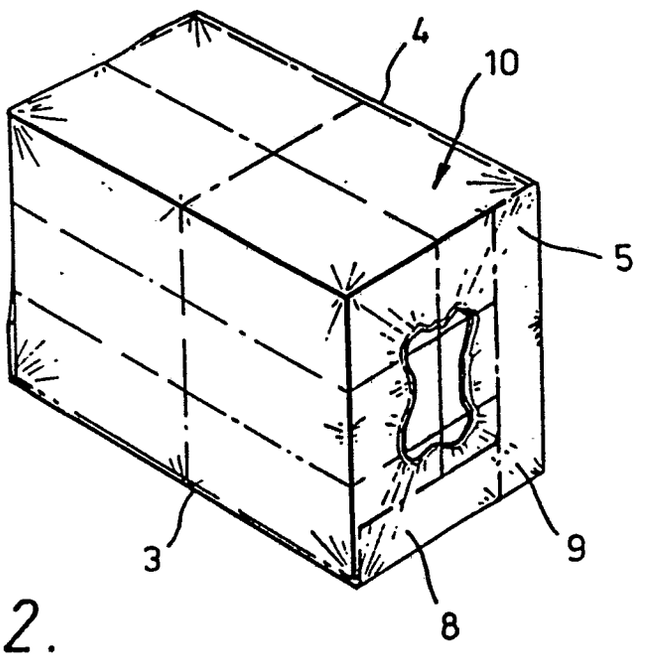


Fig.2.

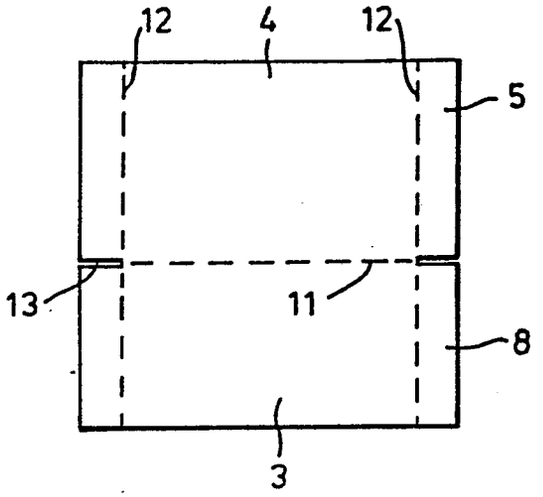
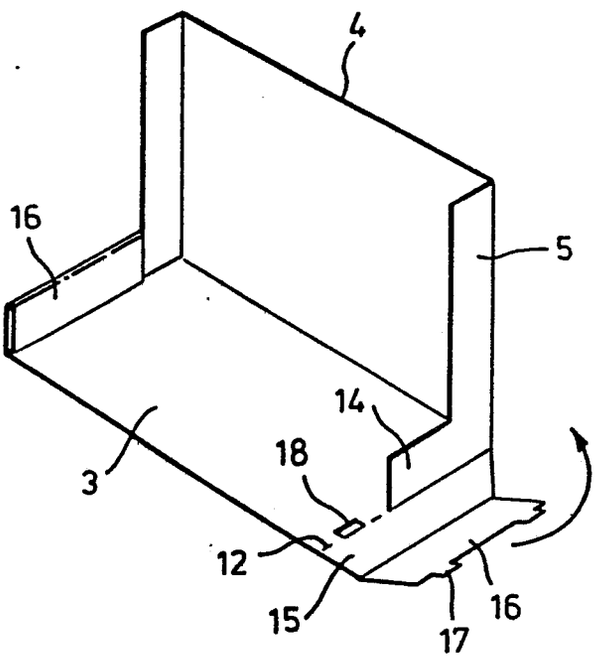


Fig.3.

Fig.4.



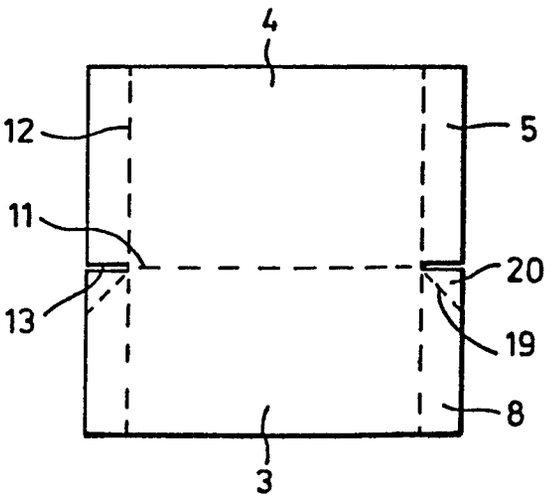
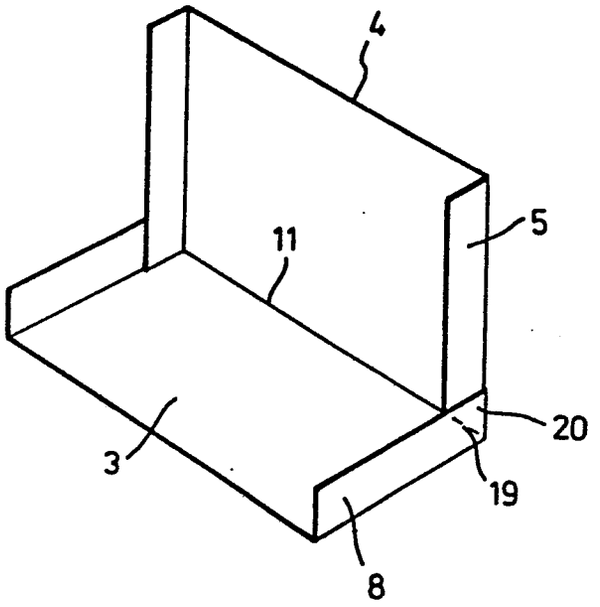


Fig.5.

Fig.6.



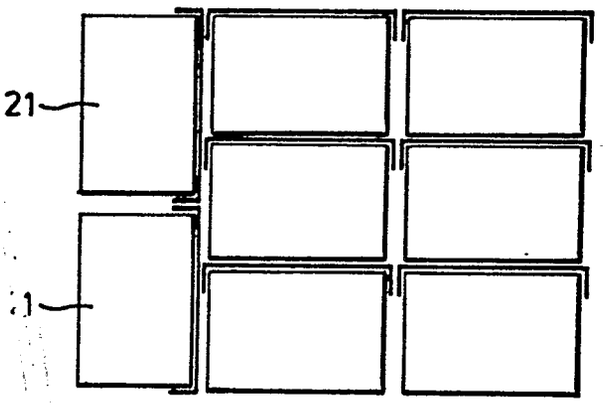


Fig.7.

Fig.8.